

CLAIMS

1. An optical fiber communication system comprising:

a signal light output device which comprises a pumping light source which outputs pumping light and a coupler which couples the pumping light to signal light;

a plurality of transmission fibers which transmit the signal light outputted from the signal light output device;

an erbium-doped fiber module which is positioned between the transmission fibers; and

a signal light reception device which receives the signal light which is outputted from the signal light output device and which passes through the transmission fibers and the erbium-doped fiber module,

wherein the erbium-doped fiber module comprises:

a divider which divides the pumping light propagated in a direction the same as that in which the signal light is propagated in the transmission fibers, from the signal light;

a branch which branches the pumping light divided by the divider in two direction, at a predetermined ratio;

an erbium-doped fiber to which the signal light passing through the divider is inputted; and

first and second coupling devices which couple the signal light to the pumping light branching off from the branch, to supply outputs of the first and the second coupling device to both ends of the erbium-doped fiber.

2. An optical fiber communication system comprising:

a signal light output device which outputs signal light;

a plurality of transmission fibers which transmit the signal light outputted from the signal light output device;

an erbium-doped fiber module which is positioned between the transmission fibers; and

a signal light reception device which comprises: a pumping light source which outputs pumping light; and a coupler which couples the pumping light to the signal light which is outputted from the signal light output device and which passes through the transmission fibers and the erbium-doped fiber module, to output the pumping light in a direction opposite to that in which the signal light is outputted,

wherein the erbium-doped fiber module comprises:

a divider which divides the pumping light propagated in the direction opposite to that in which the

signal light is propagated in the transmission fibers, from the signal light;

a branch which branches the pumping light divided by the divider in two directions, with a predetermined ratio;

an erbium-doped fiber to which the signal light is inputted; and

first and second coupling devices which couple the signal light to the pumping light branching off from the branch, to supply outputs of the first and the second coupling devices to both ends of the erbium-doped fiber.

3. An optical fiber communication system comprising:

a signal light output device which comprises a pumping light source which outputs pumping light and a coupler which couples the pumping light to signal light;

a plurality of transmission fibers which transmit the signal light outputted from the signal light output device;

an erbium-doped fiber module which is positioned between the transmission fibers; and

a signal light reception device which receives the signal light which is outputted from the signal light

output device and which passes through the transmission fibers and the erbium-doped fiber module,

wherein the erbium-doped fiber module comprises:

a circulator to which the signal light and the pumping light are inputted;

a first erbium-doped fiber to which the signal light and the pumping light passing through the circulator are inputted; and

a mirror to which the signal light and the pumping light passing through the first erbium-doped fiber are inputted, and

wherein the signal light and the pumping light reflected by the mirror are outputted to a next stage through the first erbium-doped fiber and the circulator.

4. An optical fiber communication system as claimed in Claim 3, further comprising a second erbium-doped fiber which is positioned at a front stage of the circulator.

5. An optical fiber communication system comprising:

a signal light output device which outputs signal light;

a plurality of transmission fibers which transmits the signal light outputted from the signal light output device;

an erbium-doped fiber module which is positioned between the transmission fibers; and

a signal light reception device which comprises: a pumping light source which outputs pumping light; and a coupler which couples the pumping light to the signal light which is outputted from the signal light output device and which passes through the transmission fibers and the erbium-doped fiber module, to output the pumping light in a direction opposite to that in which the signal light is outputted,

wherein the erbium-doped fiber module comprises:
a circulator to which the signal light is inputted;
a divider which divides the pumping light from the signal light;

a coupler which couples the pumping light divided by the divider, to the signal light outputted from the circulator;

a first erbium-doped fiber to which the signal light and the pumping light outputted from the coupler are inputted; and

a mirror to which the signal light and the pumping light passing through the first erbium-doped fiber are inputted, and

wherein the signal light and the pumping light reflected by the mirror are outputted to a next stage through the first erbium-doped fiber and the circulator.

6. An optical fiber communication system as claimed in Claim 5, further comprising a second erbium-doped fiber which is positioned at a front stage of the circulator,

wherein the coupler is positioned at a front stage of the second erbium-doped fiber.